shall be examined by the Geological Survey and a report made to the Secretary of Agriculture, showing that the control of such lands will promote or protect the navigation of streams on whose watersheds they lie.

Those who are familiar with the eventful history leading up to the passage of the Weeks Act know that the principle invoked in section 6 was absolutely essential both to insure the constitutionality of the measure and to secure its passage. The administrative officer, however keenly he may appreciate the spirit which encouraged the movement for the preservation of the Appalachian forests, can not disregard the plain letter of the law on the statute book.

GEO. OTIS SMITH
U. S. GEOLOGICAL SURVEY

SUGGESTIONS FOR THE CLEVELAND MEETING

TO THE EDITOR OF SCIENCE: Regarding the preparations for the meeting of the American Association for the Advancement of Science at Cleveland next year, I desire to suggest the advisability of concentrating the places of meeting so far as practicable, in order that the meeting rooms may be more conveniently found, and persons who wish to pass from one meeting place to another in order to hear a large number of papers read, may be able to do so.

Much of the benefit of these meetings depends on easy access afforded them. For this reason, the best arrangements in many years was that provided in the Central High School at St. Louis. There the basement, and the first- and second-floor classrooms were used for the different sections. Geographers could in a minute's time pass out of their meeting place to hear a paper in the session of the economist and statistican, or *vice versa*. Strangers coming in the building found the directory at the entrance, which told where each section was meeting and the room. There was no wandering about the campus, as at Chicago where some of the sections were located on the third floor of buildings; nor was there any fear of intrusion or collision with professors who had classes to hear, as at the Institute of Technology, Boston; nor was there any wandering about the streets to find where particular sections met, as in Baltimore.

A central building with wide hallways, the posting of a large directory at some outside point on a thoroughfare and the placarding of rooms, with the placard standing at right angles to the door when closed, with somebody at hand to make additional placards as needed—these suggestions seem to me worth while considering to help make our Cleveland meeting one of the best, if not the best on record.

JOHN FRANKLIN CROWELL

CHROMOSOMES IN WHEAT AND RYE

IN my paper entitled "A Theory of Mendelian Phenomena"[1] I referred to rye as having a small number of chromosomes—"six, I believe," while wheat has "40 or more," and called attention to a possible relation of these supposed facts to the great difference in variability of these two species. This reference to chromosome numbers was made on the basis of a statement made to me some years ago by a student who had made some studies of the subject. Mr. Orland E. White, of the Bussey Institution, calls my attention to the studies of Overton and of Koerniche, which indicate that wheat has sixteen chromosomes ($2X$ number).

W. J. SPILLMAN
WASHINGTON, D. C.

HOW A FALLING CAT TURNS OVER

TO THE EDITOR OF SCIENCE: In your last issue Professor W. S. Franklin mentions having given a valid explanation of how a cat is able to light on his feet when he is dropped back downwards. He does not state what this explanation was; but gives in full a different valid explanation offered by Professor J. F. Hayford. No statement is made as to which explanation agrees with the actual performance of the cat, so it may be of interest to call attention to a set of kinematograph pictures of a falling cat, published as Plate II. of H. Crabtree's "Spinning Tops and Gyroscopic Motion." These pictures corroborate

[1] American Breeders' Association, Report VI.

fully the following explanation given in the accompanying text:

"Let us regard the cat as made up of a fore part and a hind part, whose moments of inertia I_1, I_2 are equal when the legs are fully extended at right angles to the body. The photographs given in Plate II. show that it first contracts its fore legs (thereby making I_1 less than I_2) and then turns its fore part round. This latter action necessitates the hind part being turned in the opposite direction (since the total angular momentum about the axis is zero) but to a less extent, since I_2 is greater than I_1. The animal then contracts its hind legs, extends its forelegs, and gives its hind part a turn. This necessitates the fore part being turned in the reverse direction but, again, to a less extent, since I_1 is now greater than I_2. It will thus be seen that by continued action of this kind the cat can turn itself through any required angle, though at no time has it any angular momentum about its 'axis.'"

The explanation offered by Professor Hayford, although a possible one, accordingly does not agree with the actual performance of a cat, as observed by photography.

J. R. BENTON

UNIVERSITY OF FLORIDA,
December 18, 1911

SCIENTIFIC BOOKS

The Wilderness of the Upper Yukon: A Hunter's Explorations for Wild Sheep in Sub-Arctic Mountains. By CHARLES SHELDON. New York, Charles Scribner's Sons. 1911. 8vo. Pp. xxi + 354; 4 colored and 46 half-tone plates; 4 maps, one in colors.

The distribution and relationships of the mountain sheep of Canada and Alaska present one of the most interesting and puzzling problems in North American mammalogy. For the purpose of obtaining more definite information on this subject Mr. Sheldon, a hunter-naturalist of well-known qualifications for such a task, spent the seasons of 1904 and 1905 in the Northern Rockies, exploring the Ogilvie, the Selwyn and Plateau mountains and the Watson River country in 1904, and the Pelly, Rose and Glenlyon mountains in 1905. As a narrative of exploration in practically new fields, the book is an important contribution to our knowledge of the physical conditions and natural history of the region traversed, aside from its bearing upon the special quest for which these journeys were undertaken. Its excellent literary form, its abundant and admirable illustrations and the author's enthusiasm and sympathy with his surroundings, add a value and a charm to his pages unusual in books of hunting adventure. Maps are given of the districts traversed, excellent half-tones illustrate scenic features and there are four colored plates from drawings by Carl Rungius of sheep and other big game.

The sheep of northern Canada and Alaska are quite different from the well-known bighorn of the Rocky Mountains of southern Canada, the United States and northern Mexico. The first northern form to become scientifically known was the *Ovis dalli* described by E. W. Nelson in 1884 from specimens collected in the upper Yukon region of Alaska. This sheep is pure white at all seasons except for adventitious staining from soil or vegetation; it is smaller and has less massive horns than the various forms of the Rocky Mountain bighorn.

In 1897 a black form was described as *Ovis stonei* from specimens obtained in the Cheonee Mountains south of the Stikine River in northern British Columbia. Although the Alaska form is pure white, and the other so dark colored as to be known as the black sheep, the structural differences that characterize them are slight and inconstant.

A few years later (in 1901) a sheep intermediate in coloration between the white and black sheep was described as *Ovis fannini,* based on specimens collected near Dawson City. As the sheep of this general region became better known it was found that the sheep of the *fannini* type were very unstable in respect to coloration and were apparently intergrades between the white form of Alaska, the Yukon and Northwest territories and the black form of northern British Columbia.